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(54) Gaming or amusement machine

(57) A gaming or amusement machine has a spinning reel device 4 and video screen 2 on which a video game may be displayed. Operation of the machine to play the video game may take place only following a winning event displayed on the reels.

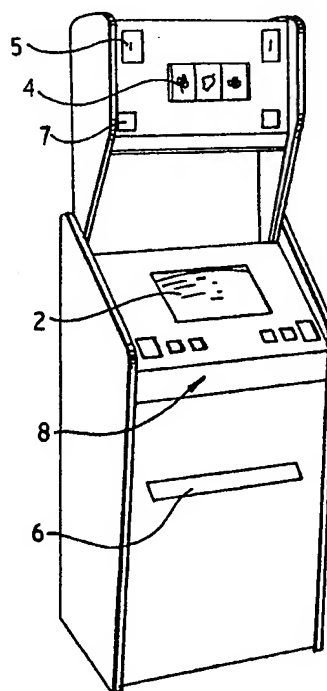


FIG.1.

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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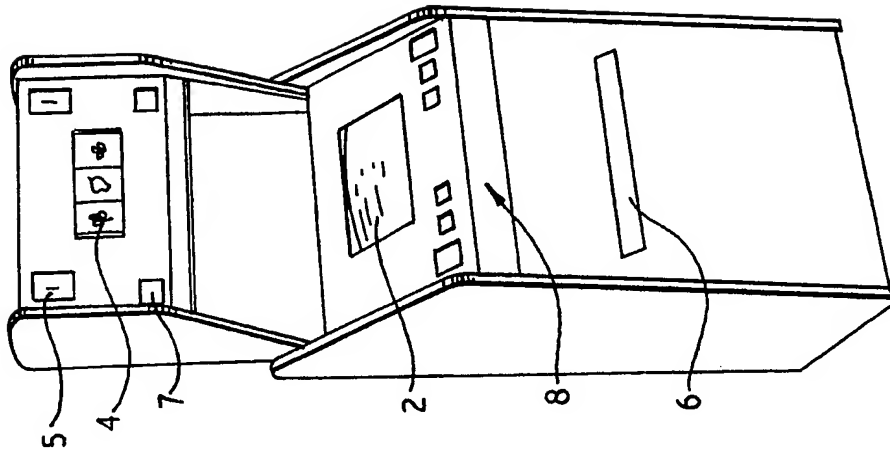


FIG. 1.

FIG. 2.

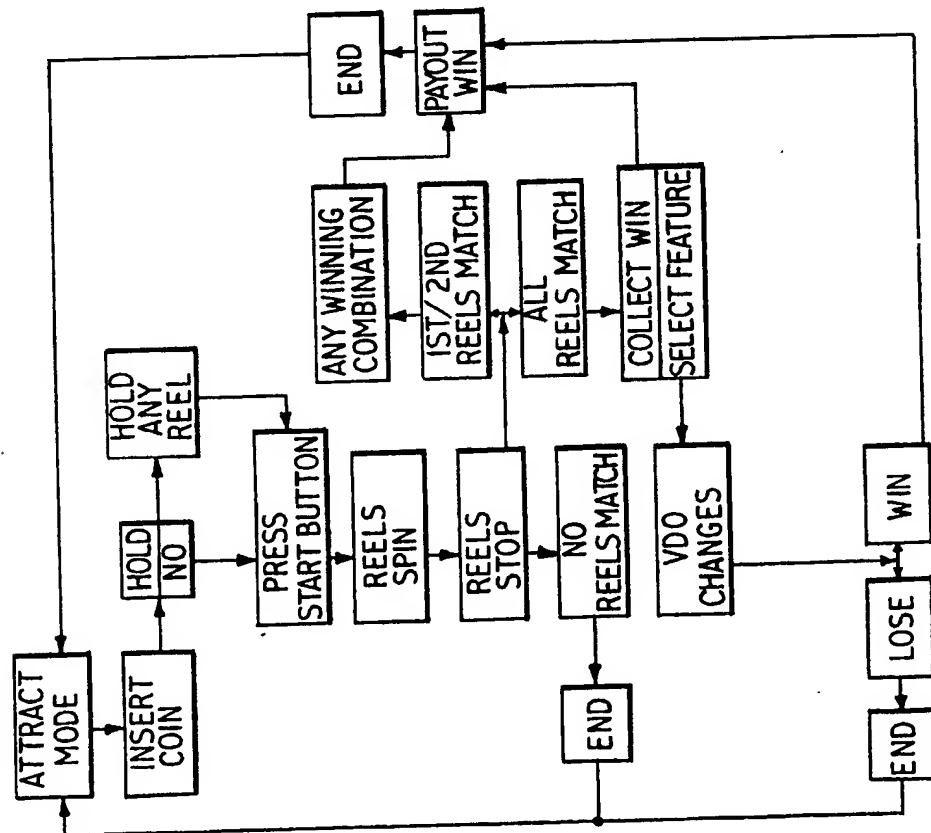
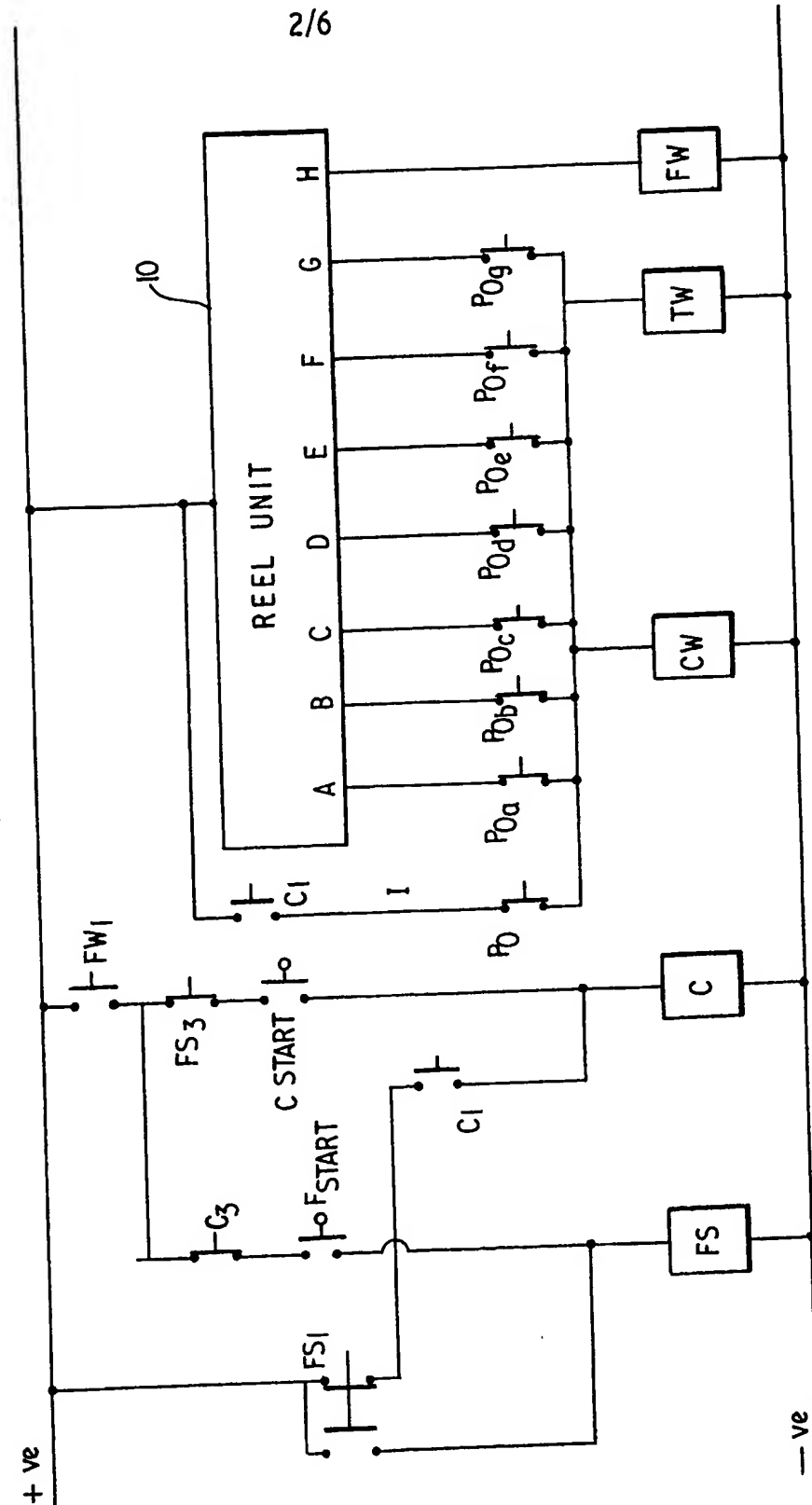


FIG. 3A.



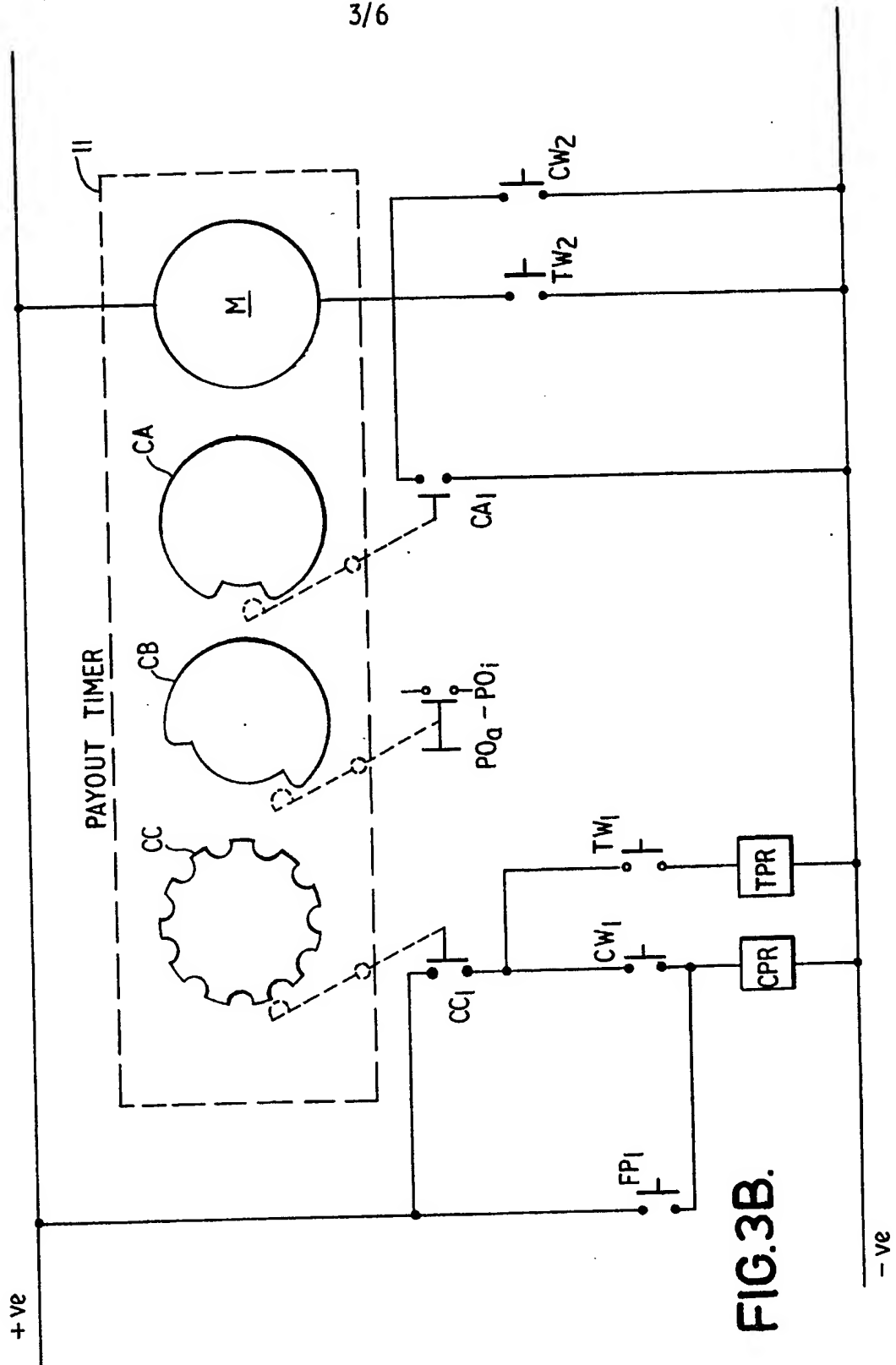


FIG.3B.

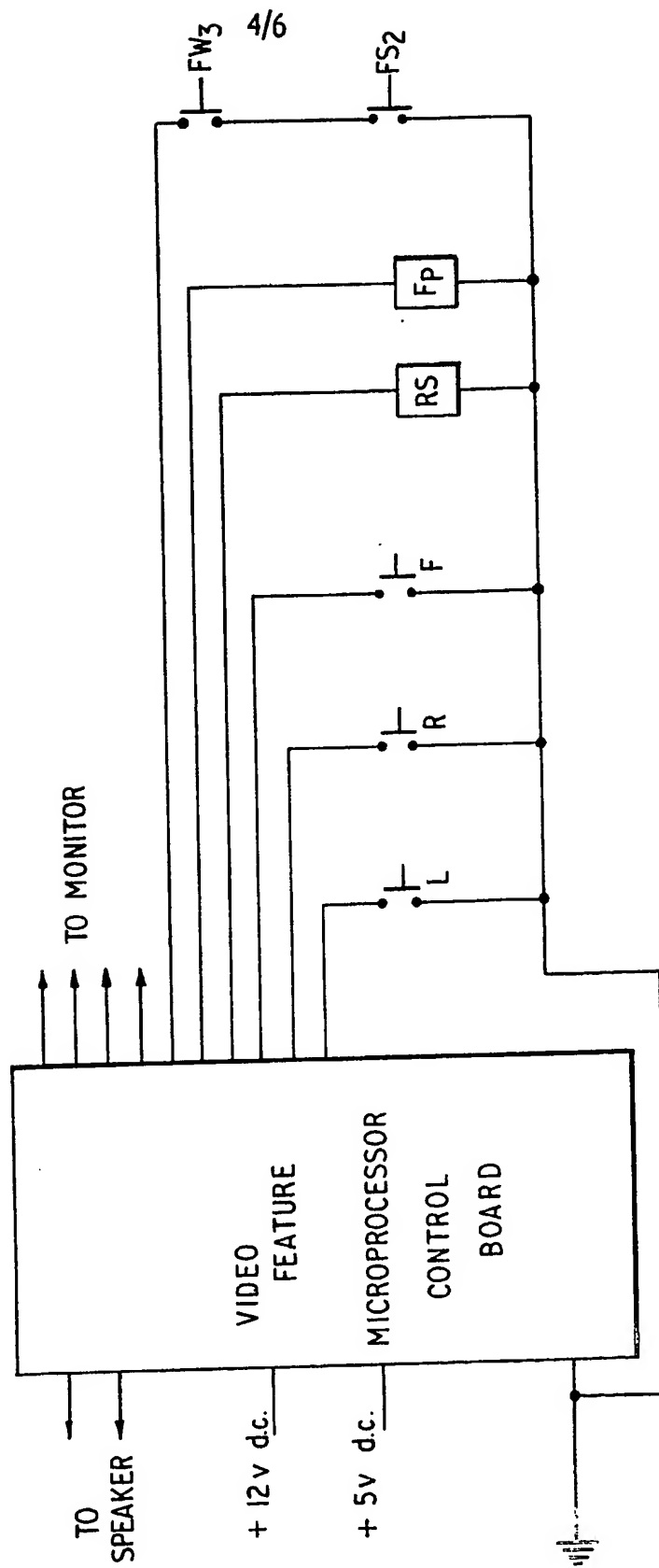


FIG.3C.

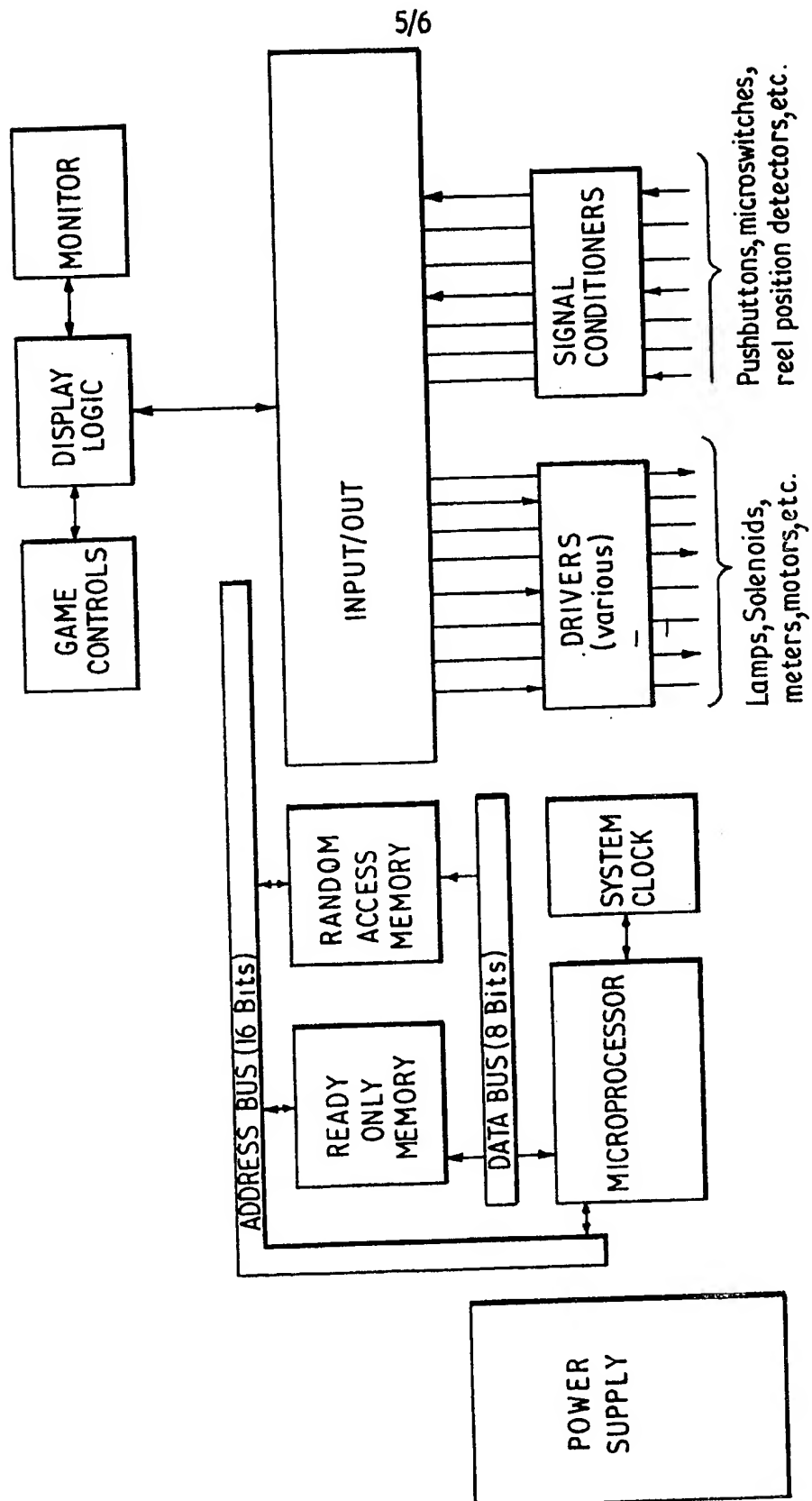


FIG. 4.

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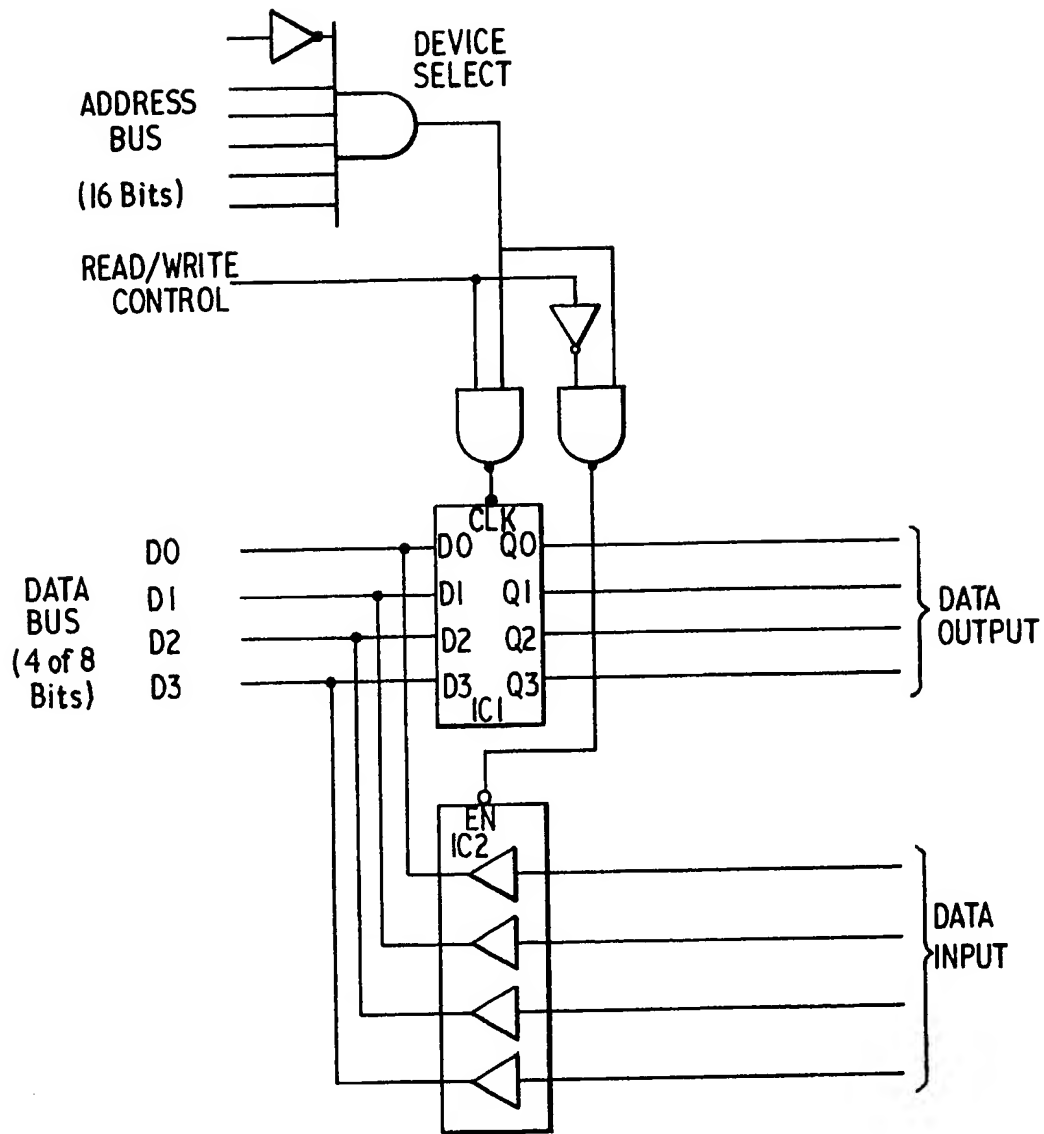


FIG.5.

SPECIFICATION

Improved gaming or amusement machine

- 5 A gaming or amusement machine is known which comprises a group of reels which bear symbols on their peripheral surfaces. The reels are made to spin following the insertion of a coin or token, and the relative positions of the
10 reels when they have all been brought to a halt determines whether a winning event has occurred and, if so, the value of a prize in the form of coins or tokens delivered automatically by the machine. The amusement value
15 of such a machine is limited.

- To increase the amusement value of a gaming machine of this type, it is proposed herein that the machine should be provided with a video display unit. This unit may be consti-
20 tuted by, incorporate or be associated with a video game unit capable of being brought into operation only following a particular winning event on the reels, referred to herein as a feature win, the player being permitted, fol-
25 lowing a feature win, to initiate operation of the video game or, if the machine is so adapted, to forego such operation and instead draw a cash or token prize. While it is possi-
30 ble, within the context of the present proposal, for the video game to be played for amusement only, it is particularly envisaged that a prize in the form of one or more coins or tokens should also be obtainable following
35 a winning event on the video game. In addition, or alternatively, the video display unit may be used to display information concerning the spinning reel game, for example, concerning the winning combinations, stake
40 and value of prizes to be won. This video display may be readily changed, simply by replacing or reprogramming a microprocessor control unit, without the trouble or expense at
45 present involved in replacing a complete machine as is necessary at present following, for example, changes in Government gaming reg-
ulations.

- In more detail, the gaming machine now proposed may comprise a casing designed to display to the player a video screen and a set
50 of three juxtaposed reels which are rotatable about a common axis and whose peripheries bear symbols which may be of the well-known fruit machine type. Slots are provided in the casing through which one or more coins or
55 tokens are inserted to play the machine, and through which coins or tokens won by a player are ejected. When the machine is initially switched on, it enters an attract mode in which the screen displays information such as
60 details of the machine site, the name of the game, instructions for playing the first part of the game, using the spinning reels, and details of the prizes available for winning events on the reels. The information displayed may
65 change at intervals in accordance with the

- programming of a microprocessor unit with which the machine is also provided. A win-
ning event on the reels is the alignment of predetermined symbols on two or three of the
70 reels, the winning symbols being displayed on the screen while the machine is in the initial attract mode and while the reels are in motion. There may be a number of different winning events, as is conventional with a
75 machine of this type, the possibility being provided of winning any of a number of different sums, depending upon which sym-
bols align with a "win line" associated with an aperture through which the reels may be
80 viewed.

- Controls are also provided for playing a video game programmed into the micropro-
cessor unit. This unit may be programmed such that the skill of the player is used to
85 control the position or movement of an image on the screen so that a winning event in the video game occurs if the player demonstrates sufficient skill. Alternatively, the image pro-
duced may be of a random nature, in which
90 case the winning event may be the display of one or more predetermined images in prefer-
ence to others. The arrangement may be such that the player may select the game to be
95 played from a number of games of one or both types programmed into the microproces-
sor unit.

- The video display unit is arranged to re-
spond to operation of the controls only follow-
ing a predetermined winning event on the
100 reels, the player being permitted to select either the drawing of a cash or token prize following a feature win on the reels, or the opportunity to stake all or part of the value of
this prize against the outcome of a video
105 game.

- Assuming that the player attracted to the machine inserts a coin or token. A "hold" lamp may now light, giving the player the opportunity to depress control buttons to hold
110 one of the three reels. The player then presses a start button and the reels spin and stop. If no winning event is signified, the game ends and returns to its attract mode. If, say, two reels match, a payout occurs in the normal
115 way. In the event, say, that all three reels match this winning event may be followed by the display on the video screen of the amount of the win and of instructions that the player should operate the controls to collect either a
120 coin or token, or to stake all or part of the amount won on this first mechanical stage of the game upon a selected video game of skill or chance. Assuming that the player elects the latter, he operates the controls to select the
125 video game and to play it. The selected game may be of a "space invaders" type, in which the controls are operated to move images on the screen, the winning event being the achievement of a score exceeding a predeter-
130 mined figure, the score being increased or

reduced in dependence on the players skill in controlling the images on the screen. Following a winning event, the machine delivers a prize. Alternatively, the microprocessor may permit the video game selected to be of a type such as "ponton". The video screen displays playing card symbols, the controls being operated by the player to determine how many such cards are displayed. Each card displayed results in the deduction of an amount from the total won on the reels and the balance is displayed on the screen too. The microprocessor unit may also be arranged to act as the dealer and to display on the screen cards dealt to itself. Assuming that the player "sticks" after staking 30p of the winnings on the reels on three cards which total 20 points while the machine scores 19 points, the player wins and receives winnings of 60p plus change left from the winnings on the reels.

It is possible to construct and arrange a machine in a number of different ways in order to achieve the operations and effect described above. Two examples will now be described with reference to the drawings, wherein:

Figure 1 shows the external features of a machine in accordance with the present proposal in a perspective view.

Figure 2 is a diagram to show the sequence of operations performed by the machine.

Figures 3a, 3b and 3c show parts of the circuitry of an electro-mechanical spinning reel type gaming machine, incorporating a video display unit, in order to indicate the inter-relationship between the reel unit and video display unit.

Figure 4 is a block diagram of a microprocessor controlled spinning reel gaming machine, incorporating a video display unit, and

Figure 5 shows an interface unit for the embodiment shown in *Fig. 4*.

Referring to *Fig. 1*, the gaming machine shown therein comprises a casing 1 apertured to reveal the screen 2 of the cathode ray tube of a video display unit and the peripheral surfaces of three reels 4 of a reel unit. The peripheral surfaces of the reels are marked with various symbols, in particular items of fruit, and the aperture through which the reels are visible is marked with a "win line". The casing has slots 5 for the insertion of coins and a tray 6 for the reception of coins and tokens delivered by the machine as prizes. Manual controls 7 are provided for operating the reels and manual controls 8 for the control of a micro-processor control unit of the video display unit. The casing also houses a loud-speaker to which signals are supplied by the microprocessor.

Within the casing, but not illustrated, the reels are mounted on a drive shaft, each reel being coupled to the shaft by way of a slip clutch to permit the reels to be halted individ-

ually while the shaft continues to rotate. The shaft is drivable by means of an electric motor, and each reel is associated with an index solenoid which, when energised, permits the reel to rotate. Provided that microswitches associated with the coin and token slots 5 have responded to the insertion of coins or tokens of sufficient value and activated the machine accordingly for an operation, energisation of the motor circuit may be effected by closing a start push-button switch. Closing this switch also energises the motor of a control cam timer which performs one complete rotation for each operation of the machine and performs overall sequence timing. This arrangement is conventional. Also conventional, and likewise not illustrated, the machine includes a cam timer, which determines by the position in which it comes to rest, whether a "hold" is available for the next operation, in other words, whether the player may hold any of the reels stationary. Provided that this timer indicates the availability of a "hold", hold relays may be energised and latched by closing push-button switches associated with the reels. Each hold relay which is energised opens a normally closed contact in the circuit of an index solenoid to prevent its energisation and spinning of the associated reel.

Fast with each reel is a disc formed with a slot for reception of a bar for holding the reel in a fixed position. As the control cam enters three successive predetermined positions, the bars of the three reels are moved into their locking position, the reels being halted in sequence in this manner until when the third and last reel is halted, the motor driving the reels is deenergised. The reel unit is represented by the box 10 shown in *Fig. 3* and, in the event that the reels halt with a winning combination of symbols in alignment on the win line, the interengagement of selected studs and wipers on the reels results in the appearance of a signal on a number of outputs (A to H) from the reel unit, depending upon the prize awarded. Thus a signal on line A indicates a prize in cash of 20p, on lines B, C and D of cash prizes of 30p, 40p and 50p, respectively and on line E of a cash prize of £1. Signals on lines F and G indicate prizes of tokens valued at £1.50 and £2 respectively. A signal on line H, however, indicates a feature win, namely that the player has won the entitlement to play the video game, or to collect instead a cash prize of, say, 20p in lieu.

The dispensing of the cash and token prizes for normal wins is controlled by a payout timer indicated within the box 11 in *Fig. 3b*. This timer comprises a motor M for driving a cam, or set of cams, with cam tracks, indicated at CA, CB and CC for operating certain microswitches.

Returning to *Fig. 3a*, the output lines A to E

from the reel unit 10, are connected to a cash win relay CW, the lines F and G to a token win relay TW, and the line H to a feature win relay FW. The cash win relay CW may also be energised by a signal on a further line I which bypasses the reel unit, for a purpose which will shortly become clear. The lines A to G and I include the contacts of payout timer microswitches POa to POg and POi.

10 The cam track CA of payout timer 11 is associated with a contact CA1 which is closed when the cam begins to rotate and close a circuit through the payout timer motor M until the cam has rotated through one revolution,

15 the contact CA1 re-opens to terminate the supply to the motor. The cam track CC has a series of evenly distributed notches, the number of which is equal to the maximum cash prize in coins of a suitable value, for example, 10p pieces. During rotation of the cam a contact CC1, associated with the track CC repeatedly closes and re-opens in the circuit of cash and token payout relays CPR and TPR. The circuits of these relays also include normally open contacts CW1 and TW1, respectively, of the cash and token win relays CW and TW shown in Fig. 3. The microswitches POa and POi are all closed when the cam timer is in its start position.

30 The cam track CB is so arranged that the contacts POa to POe open successively one after the other at predetermined moments of time, and likewise the contacts POf and POg in accordance with a separate sequence. The contact POi is arranged to open at the same time as one of the contacts POa to POe, depending upon the value of the prize to be given in lieu of the entitlement to play a video game.

40 Each of the relays CW and TW has a normally closed contact in the circuit of the control cam motor (not shown) so that the control cam is halted when a win signal appears on one of the output lines A to G.

45 Each relay also has a normally open contact CW2, TW2 respectively in further circuits for energising the payout cam timer motor M.

Assuming a normal cash win, i.e. not a feature win, a signal appears on one of the output lines A to E. The payout timer is stationary in its start position so that contacts POa to POe are closed. Relay CW is energised and contact CW1 in the circuit of the cash payout relay CPR and CW2 in the circuit of the motor M are closed. The motor is energised and starts to rotate the timer cam or cams. Contact CA1 closes to maintain the supply to the motor despite subsequent opening of contact CW2. Contact CC1 repeatedly closes causing a series of pulses to be supplied to the cash payout relay CPR, a contact of which responds to operate the solenoid of a meter which delivers a 10p coin in response to each pulse which it receives. The cash payout relay is energised each time that the

contact CC1 closes but only so long as the relay CW remains energised and contact CW1 is closed.

Simultaneously, the cam track CB causes the contacts POa to POe to open one after another, the opening of these contacts being synchronised with the operation of the contact CC1. Thus, contact POa opens after contact CC1 has closed twice, contact POb after contact CC1 has closed three times and so on, to de-energise relay CW and prevent the delivery of further coins.

If a token win is indicated by a signal on output line F or G, a meter is operated to deliver the correct number of tokens in exactly the same way as a result of the energisation of relay TW and closing of contacts TW1 and TW2.

In the event however that the symbols aligned with the win line indicate a feature win, a signal appears on the output line H from the reel unit to energise the feature win relay FW. A first normally open contact (not shown) of this relay closes to illuminate a lamp indicating the feature win and informing the player that he may choose between collecting a cash prize or playing the video game. Contact FW1 closes in the circuit of a collect relay C and a feature start relay FS. If the player elects to take a fixed sum, he closes a switch C_{START} in the circuit of the relay C with the result that contact C1 of this relay closes in line I to energise the cash win relay CW (which has remained un-energised because of the absence of any signal on lines A to E) and initiate operation of the payout cam timer to deliver a prize having a value determined by the length of the part of the cam track CB associated with contact POi, in the manner described above. At the same time, contact C2 of relay C opens in the circuit of feature start relay FS to prevent use of the video unit. Contact FS1 remains in the position shown so that the relay C is latched following closing of a self-holding contact C3. Should, however, the player choose to play the video game, he closes instead switch F_{START} so resulting in de-energising of relay FS since contact C2 remains closed. Contact FS1 picks-up and relay FS latches.

Referring now to Fig. 3c, the microprocessor control board of the video display unit has a circuit including contacts FS2 and FW3 of the feature win and feature start relays. Following energisation of both relays, these contacts close, signalling the microprocessor to change mode. Accordingly, the attract mode (or a mode entered when the machine was brought into use) is ended, and a game programme contained in the microprocessor is brought into use. The programme may include the display of information on the screen as to the way of playing the video game, before entering a playing mode in which manually controlled switches L, R and F used by

the player to move an image displayed on the screen to the left and to the right, and to fire images representing projectiles.

Because contact FS3 opens in the circuit of the collect relay C, contact C1 opens in line I and relay CW remains de-energised.

The construction of the microprocessor control unit and its incorporation in the video display unit and connection to a loudspeaker as indicated in Fig. 3c, together with its programming, is well-known to those skilled in the art and will not be described further herein. In the event that the player wins the video game in accordance with whatever rules are included in the programme, a relay FP in Fig. 3c is energised and closes a contact FP1 in the circuit of the cash payout relay CPR shown in Fig. 3b to cause a cash prize to be dispensed without involving the payout timer. The circuits associated with the microprocessor control unit may be readily modified to cause changes in presentation on the screen in response to energisation of the relays CW, CT and FW so that the fact of cash, token or feature wins is indicated visually on the screen.

Following the completion of a full sequence of operation on the machine, the control timer is returned to its start position as a result of a signal produced by closing of a further contact (not shown) of the collect relay C or the return of the payout timer to its home position, or the closing of a contact of a reset relay RS in the circuit of the video feature control board. Just before the control timer reaches its start position, all latched relays are released, and the machine re-enters the attract mode.

Of course, a practical construction of the machine requires circuits and components further to those described and illustrated for the purpose of explaining the inter-relationship between the reel and the video unit. These further circuits and components will be familiar to those skilled in the mechanical and video gaming machine arts.

The sequence of operations is illustrated in Fig. 2, wherein it is assumed that the matching of symbols on the first and second reels leads to a normal cash or token win, while the matching of all reels leads to a feature win.

The electro-mechanical game unit may be controlled by a microprocessor control unit of a type conventionally available which is re-programmed to give additional input and output controls as shown in Fig. 4, which is a block diagram showing the basic machine controller, together with the display logic from an input/output (I/O) circuitry.

Most microprocessor controllers have spare input and output capabilities and this may be used for communication with the display logic as indicated. If, however, no spare capacity exists it is necessary to extend the input/output as follows.

An unused device address is selected and

used to control an interface with latched output, these being offered to the data input through a similar unit on the display logic. A circuit diagram of the unit including a quad latch IC1 and three state buffer IC2 is shown in Fig. 5. The data received back is strobed onto the data bus when the read/write control line is low and the correct device address is present on the address bus. Therefore, data is input and output in a similar manner to storing and retrieving data from a memory location.

In use, the microprocessor controls the game functions according to the data stored in its permanent memory, performing electronically the tasks described above in relation to electro-mechanical controllers. However, when a feature win is detected and the player elects to play the video game, a signal is output to the video logic, this being in the form of setting one of, for example, four data bits. The display which will be in its attract mode will frequently sample these data lines and when the appropriate bit is set, will commence the video game. At the conclusion of the game, information as to the amount to be paid out will be written on the video's quad output latch. This will be detected by the gaming controls, whilst the video game was being played, would continually sample its input interface to await the arrival of payout information. The appropriate prize is then output and when complete the gaming control writes zeros into its four bit latch as an acknowledgement that payment is complete and will revert to its normal function. The video logic should now detect the absence of the initializing and write zeros into its output register, after which it reverts to the attract mode, the sequence being complete.

A single microprocessor control unit may be used to combine both the spinning reel and video logic into one unit as only one function is required at a time.

Although as described herein the reels rotate about a common axis in conventional fruit machine manner, and have the symbols of the peripheral surfaces of the reels, it will be appreciated that it is possible for the reels to be replaced by discs, for example, which rotate about respective parallel axes.

CLAIMS

1. A gaming or amusement machine including a plurality of rotatable reels bearing indicia, a drive mechanism for setting the reels in motion, a video means including electronic means for generating a signal, and a video display screen on which the signal is displayed as an image, the electronic means being adapted to permit a video game to be played wherein the operation of the video means to play a video game is permitted to take place only following halting of the reels in a predetermined winning relationship.

2. A gaming or amusement machine including a plurality of rotatable reels bearing indicia, a drive mechanism for setting the reels in motion, actuation of the drive mechanism being caused or permitted by a coin or token-freed device, a video game unit including electronic means for generating a signal and a video display screen on which the signal is displayed as an image, the electronic means being controllable either by the player or operating at least partially at random, and a mechanism for releasing to the player at least one coin or token following the display on the screen of a predetermined image; wherein initiation of the operation of the video game unit or of the coin or token release mechanism is permitted to take place only following halting of the reels in a predetermined winning relationship.
3. A machine as claimed in claim 2, including means operable following halting of the reels in a predetermined winning relationship to selectively initiate operation of the video game unit or of the coin or token release mechanism.
4. A machine as claimed in claim 3, including means for displaying the amount of the player's winnings following halting of the reels in a predetermined winning relationship, means for permitting the player to stake all or part of this amount on the outcome of a game played on the video game unit, the display of said amount being reduced by the amount of the stake.
5. A gaming or amusement machine including a plurality of rotatable reels which bear indicia on their peripheral surfaces, a drive mechanism for setting the reels in motion, actuation of the drive mechanism being caused or permitted by a coin or token-freed device, a mechanism for releasing to the player at least one coin or token following halting of the reels in a predetermined winning relationship, an electronic unit for generating a signal and a video display screen on which the signal is displayed as an image indicative of the winning combination of indicia on the reels, the electronic unit being reprogrammable to vary the display.
6. A gaming or amusement machine including a plurality of rotatable reels bearing indicia, a drive mechanism for setting the reels in motion, actuation of the drive mechanism being caused or permitted by a coin or token-freed device, a mechanism for releasing to the player at least one coin or token following halting of the reels in a predetermined winning relationship, a video display screen, and an electronic unit for generating a signal which is displayed as an image on the screen indicative of information concerning the game to be played on the machine, the electronic unit being reprogrammable to vary the display.
7. A gaming or amusement machine sub-

stantially as hereinbefore described with reference to the accompanying drawing.

CLAIMS (10 Jun 1981)

2. A gaming or amusement machine including a plurality of rotatable reels bearing indicia, a drive mechanism for setting the reels in motion, actuation of the drive mechanism being caused or permitted by a coin or token-freed device, electronic means for generating a signal and a video display screen on which the signal is displayed as an image, the electronic means being controllable either by the player or operating at least partially at random, thereby to permit the playing of a video game, and a mechanism for releasing to the player at least one coin or token following the display on the screen of a predetermined image; wherein operation of the electronic means to permit the playing of a video game or of the coin or token release mechanism is permitted to take place only following halting of the reels in a predetermined winning relationship.
3. A machine as claimed in claim 2, including means operable following halting of the reels in a predetermined winning relationship to selectively initiate operation of the electronic means to permit the playing of a video game or of the coin or token release mechanism.
4. A machine as claimed in claim 3, including means for displaying the amount of the player's winnings following halting of the reels in a predetermined winning relationship, means for permitting the player to stake all or part of this amount on the outcome of a video game, the display of said amount being reduced by the amount of the stake.
5. A machine as claimed in any of claims 2 to 4, wherein electronic means controls the functions of the reels and other mechanisms of the machine.
6. A machine as claimed in any preceding claim, wherein the electronic means is adapted during an attract mode to generate a signal for causing the screen to display information, said means being reprogrammable to vary the information displayed.
7. A machine substantially as hereinbefore described with reference to Figs. 1 to 3a, 3b and 3c, or Figs. 4 and 5 of the drawings.

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(56) Documents cited

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GB 1591623

(58) Field of search

G4V

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(54) Entertainment machines

(57) A coin-operated entertainment machine, which may be of the fruit machine kind, has a number of display regions at which are produced, at the end of a game, a combination of fixed visual displays (A, B, C), the aim being for a player to try to obtain a winning such combination.

At the end of a game and before evaluation of the resulting display combination a control facility may become available which can operate automatically (if desired after operation of a control 15) to change the displayed combination with the aim of converting a losing combination to a winning combination.

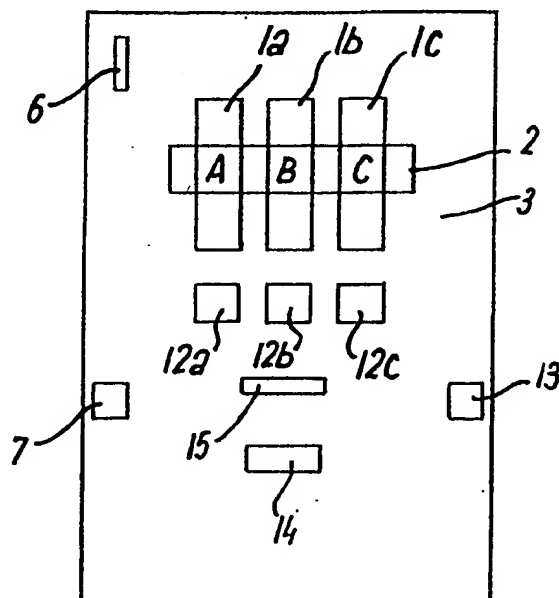
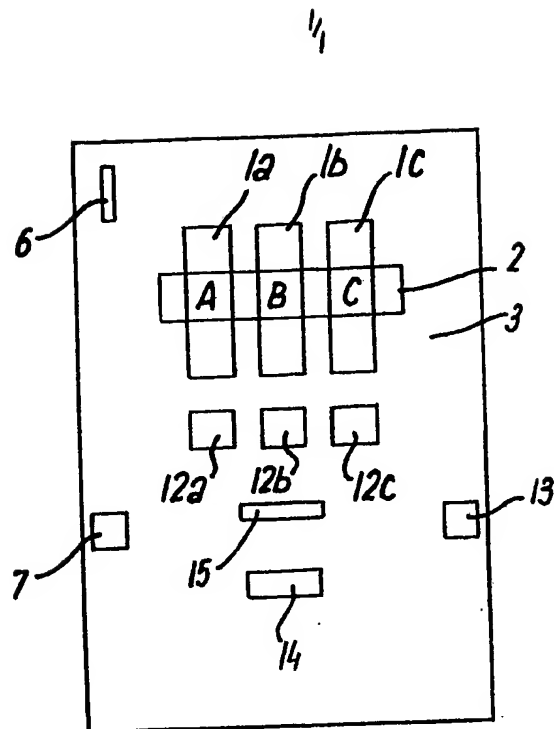
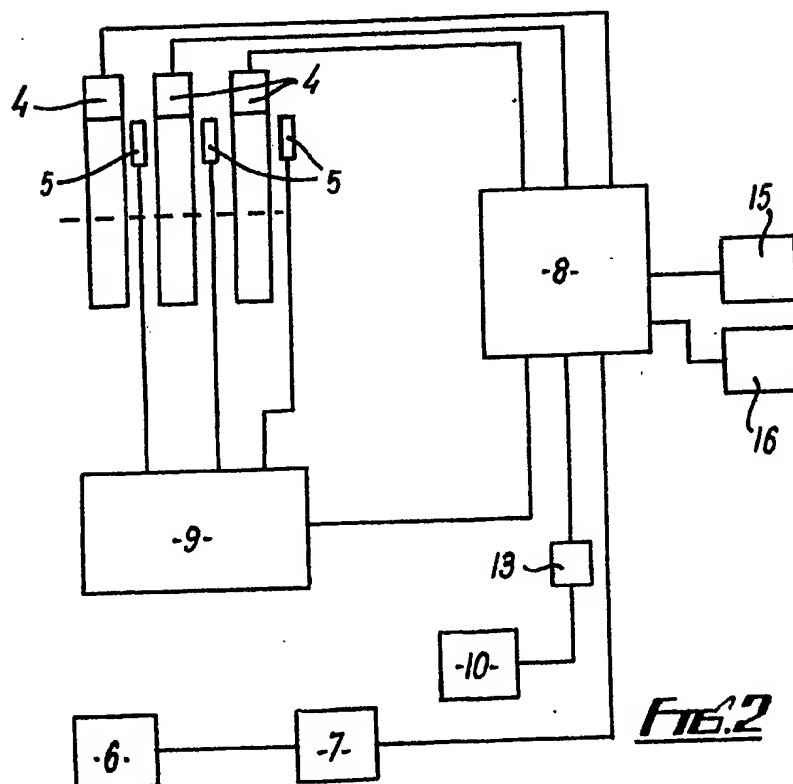


FIG. 1

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FIG. 1FIG. 2

SPECIFICATION

Entertainment machines

This invention relates to entertainment machines of the kind, hereinafter referred to as the kind defined, which can be operated by a player at the start of a game, after actuation of a coin or token mechanism of the machine, to initiate performance of first machine operations represented by visual displays of a moving or changing nature at a plurality of display regions on the machine, such first operations terminating at random at the end of the game in a combination of fixed visual displays at such regions, and which is arranged to perform further operations resulting in a win indication in the event that said combination of fixed displays at the end of the game is of a predetermined nature.

With an entertainment machine of the kind defined which is a fruit machine and utilises a plurality of rotatable reels with symbols (such as pictures of fruit) around the periphery of same to provide the visual displays, it is known to provide "nudge" controls which are rendered operable at the end of some (randomly selected) games and can then be actuated by the player to effect limited indexing of one or more of the reels such as to change the symbols displayed therewith. In this way the player can try to convert a losing combination of symbols into a winning combination by the exercise of skill.

This known nudge feature is generally popular. However, in some cases, especially where a player is not specially skilful in the use of the nudge controls the known nudge feature may present little attraction or may even detract from the entertainment value of the machine in so far as the player may not feel able to take full advantage of the opportunity for improving his position with which he is presented.

An object of the present invention is to provide a machine of the kind defined with which the player can be provided with an opportunity of improving the combination obtained without requiring such player to exercise special expertise or skill.

According to the invention therefore there is provided a machine of the kind defined having a control device which is operable to provide a control facility to cause fixed displays at at least one said display region to change to a different fixed display as selected automatically by the machine with the aim of improving the combination of fixed displays at said display regions.

With this arrangement, whenever said control facility is made available and is brought into operation the player may be provided with an opportunity of improving the combination obtained, particularly by converting a non-winning combination into a winning combination, without requiring the exercise of special expertise or skill on behalf of the player. Accordingly, the provision of the said control in the machine of the invention can appreciably contribute to the entertainment

value thereof. The said control facility may become available at the end of a game i.e. after performance and termination of said first operations and before performance of said further operations. However, it is also possible for the said control facility to be made available at the start of a game i.e. after actuation of the coin mechanism but before performance of said first operations (or even wholly or partially in substitution therefor).

Most preferably the machine of the invention is a fruit machine utilising a plurality (usually three or four) rotatable reels with symbols (such as pictures of fruit) around the periphery of same to provide the moving visual displays, and in this case winning combinations may require the presence of a plurality of symbols of the same kind and the said control may be arranged to change the fixed display to one or some of the display regions to symbols thereof of like kind to the symbol displayed at a first one of the said display regions. However, it is to be understood that the invention is not intended to be restricted to this kind of machine, and the machine of the invention may utilise moving members other than reels, or may utilise a changing display not involving moving members such as a changing pattern of illuminated lamps or a changing vdu display. Also, the display may involve symbols other than fruit and may involve any kind of winning combination thereof.

Most preferably the said control facility is made available in a predetermined and/or random manner at the start or end of some games only. When made available the said control facility may be brought into operation automatically at the appropriate stage. Alternatively and preferably however, the player is provided with some degree of choice in that, for example, the control facility comes into operation only after initiation thereof by a player-operable switch, or a player-operable cancel switch is provided to enable the player to cancel the control facility if desired. Further, where such degree of choice is made available the machine may be provided with additional player-operable control devices such as nudge controls which can be used by the player at the end of the game as an alternative to the said control facility. In a particularly preferred embodiment the control facility is arranged to come into operation after initiation by a player-operable control switch and additional player-operable controls, such as nudge controls are provided for initiation of an alternative facility, the arrangement being such that operation of the said control switch renders inoperable the additional player-operable controls and *vice versa*.

The invention will now be described further by way of example only and with reference to the accompanying drawings in which:—

Fig. 1 is a diagrammatic representation of a front panel of one form of a machine according to the present invention; and

Fig. 2 is a diagrammatic representation illustrating the construction of such machine.

The machine is a fruit machine having three

reels 1a, 1b, 1c, which are rotatable within a housing behind a window 2 in a front panel 3 thereof. Each reel 1 has pictures of fruit (designated A, B, C) at 20 positions around the periphery of same, and rotation of each reel is initiated and also arrested by a solenoid device 4 having a pawl engageable with teeth around the edge of the reel. Actuation of the solenoid 4 causes the pawl to be withdrawn from engagement with the teeth and to cause the reel 1 to rotate freely, and deactuation of the solenoid causes the pawl to drop back into engagement with the teeth to arrest the reel in one of 20 stopping positions thereof in which one of the pictures of fruit on the periphery of same is in precise registration with the window 2. Each stopping position is identified by a respective coded arrangement of holes in a side wall of the reel and the codes are read by a bank of photosensitive devices 5 which receive light from a light source or sources through the holes.

In use, the machine is actuated by a player by insertion of one or more coins or tokens into a coin mechanism 6, and a starter button 7 is pressed to operate a control unit 8 which causes the three reels 1 to be set in rotation for different random periods of time. After the reels have come to rest, the stopping positions thereof are identified by the photosensitive devices 5 in conjunction with data processing circuitry 9 and a win indication is produced which may enable a pay-out mechanism 10 to be actuated by a pay-out button 13 in the event that the identified stopping positions correspond to the display of a predetermined winning combination of fruit (say three fruit of the same kind) through the window 2. Coins or tokens paid out are delivered to the player through an outlet 14.

Three control buttons 12a, 12b, 12c, are arranged respectively beneath the reels 1 on the front panel and at the end of some games, as selected on a random basis, one or more such buttons are rendered operable and are illuminated to indicate such operability to the player. These buttons 12 perform a conventional nudge function that is, the player can press the illuminated buttons one at a time to effect indexing of the associated reels with the aim of converting a non-winning combination into a winning combination. In accordance with conventional practice the arrangement may be such that the reels are movable stepwise one position at a time (or alternatively in a freely rotating manner) either in one direction only or selectively in either direction (in which case pairs of nudge buttons for forwards and backwards movement may be required) with an overall limitation being imposed on the scope of such movement (in terms of time period or overall number of reel positions changed).

In addition to the nudge buttons 12 the machine has on the front panel thereof an automatic adjustment button 15. This is rendered operable (and is illuminated whenever the nudge facility is made available). The button 15 and the buttons 12 are available for use optionally by the

player. If the player decides to use the buttons 12 in the manner described above the button 15 is deactuated. Similarly operation of the button 15 deactuates the buttons 12. When the button 15 is operated an automatic adjustment mechanism 16 causes the position of one or more of the reels to be adjusted with the aim of changing the displayed combination of symbols on the winning line from the original losing combination to a new, winning combination, such change being effected automatically and without the involvement of the player. The operation of the mechanism 16 may be such that the attainment of a winning combination is guaranteed and this may be achieved in any suitable manner for example by moving one or two of the reels to positions at which a winning combination is completed with the displayed symbol of the or each other reel. The attainment of a winning combination however need not be guaranteed and instead it is possible for there to be some limitation on the scope of adjustment of the reel positions (as by time period or overall number of positions adjusted) whereby such adjustment mechanism attempts to attain a winning combination but in some cases may not be capable of doing so.

With this arrangement if a player is not sufficiently confident of his expertise with the nudge buttons he can instead operate the adjustment mechanism when this facility is made available whereby he is provided with an opportunity of improving his position without having to exercise any skill in order to take advantage of such opportunity. On the other hand, if the player is confident of his skill he has the option of utilising the nudge buttons as an alternative to the adjustment button and this may be advantageous to the skilled player in so far as he may be able to obtain a winning combination of higher value than that which the adjustment mechanism would produce.

Adjustment of the reel positions with the adjustment mechanism may be achieved in any suitable manner. Thus, one or more of the reels (say the middle and last reel 1b, 1c) may be set in rotation and may continue rotating until the pertaining banks of photosensitive devices 5 determines that such reels 1b, 1c are at positions (or are about to attain positions) at which the fruit on same as displayed through the window 2 are the same as the displayed fruit of the first reel 1a. The reels 1b, 1c can then be arrested in this position. Alternatively, utilising knowledge of the sequence of symbols on the reels, the reels may be indexed stepwise through predetermined numbers of stopping positions with the aim of attaining the nearest or the highest value winning combination within a predetermined maximum number of index steps.

It is of course to be understood that the invention is not intended to be restricted to the details of the above embodiment which are described by way of example only. Thus, for example, the arrangement may be such that the adjustment feature when available comes into

operation automatically after allowing a short period of time for the player to cancel the automatic adjustment by operating the nudge buttons (or by operating a cancel button which replaces the button 15).

Further, as an alternative to the use of the solenoids 4 and the code-reading sensors 5 it is possible to use, for example, respective stepper motors for driving the respective reels, and a position detection system which responds to and counts stopping positions from datum points on the reels (defined for example by light sensitive devices which receive light through holes in the reels).

Still further, as an alternative to the use of reels it is possible to use a vdu display which stimulates the rotation of reels, and in this case the automatic adjustment mechanism may be operable to interchange displays with adjacent displays in the manner described in our co-pending Application of even date which claims priority from Application No. 8103754. Such Application describes a coin- or token-operated entertainment machine having a plurality of display regions and which can be operated by a player to produce a display of one or more symbols at each of said regions with the aim of attaining a winning combination thereof, said display regions being defined by regions of a vdu screen, characterised in that the machine has a control which is operable, preferably, by a player, to effect replacement of at least one symbol displayed at at least one display region with a symbol displayed on said screen other than at said display region. As described in the specification of such Application the replaced symbol may re-appear in or move across the screen to the position previously occupied by the replacement symbol. Also, the entire content of the display region (which may be a vertical group of three or more symbols simulating a section of a reel periphery) may be interchanged together or otherwise replaced.

Further, it is to be understood that operation of the adjustment feature is not restricted to the end of a game as described above. Instead it is possible for the adjustment feature to be made available at the start of a game possibly in conjunction with a "hold" facility. Thus, the arrangement may be such that the adjustment feature can be used at the start of a game and, in the event that a winning combination is thereby obtained this can be held to guarantee a pay-out. If a winning combination is not obtained the player can then play the game in the normal manner.

CLAIMS

1. A machine of the kind defined having a control device which is operable to provide a control facility to cause a fixed display at at least

one said display region to change to a different fixed display as selected automatically by the machine with the aim of improving the combination of fixed displays at said display regions.

2. A machine according to claim 1, which is a fruit machine utilising a plurality of rotatable reels with symbols around the periphery of same to provide the moving visual displays.

3. A machine according to claim 1, which is a fruit machine utilising a changing vdu display simulating the rotation of reels to provide the moving visual displays.

4. A machine according to any one of claims 1 to 3, wherein said control facility is made available for some games only.

5. A machine according to any one of claims 1 to 4, wherein said control facility when made available is brought into operation automatically.

6. A machine according to any one of claims 1 to 4, wherein said control facility when made available is arranged to be brought into operation only after initiation thereof by a player-operable switch.

7. A machine according to any one of claims 1 to 4, wherein said control facility when made available is arranged to be brought into operation automatically unless cancelled by a player-operable switch.

8. A machine according to claim 6 or 7, having additional player-operable control devices which can be used by the player at the end of the game as an alternative to the said control facility.

9. A machine according to claim 8, which is a fruit machine and wherein said additional player-operable control devices comprise nudge controls.

10. A machine according to any one of claims 1 to 9, wherein said control facility is arranged to operate such that it is ensured that said combination of fixed displays after said control facility operation always constitutes a winning combination.

11. A machine according to any one of claims 1 to 9, wherein limitations are imposed on the operation of said control facility such that it is not ensured that said combination of fixed displays after said control facility operation always constitutes a winning combination.

12. A machine according to claim 2 or 3, or any claim dependent on claim 2 or 3, wherein said control facility is arranged to operate by effecting stepwise indexing of one or more said reels or simulated reels.

13. A machine according to claim 3, or any one of claims 4 to 11, when dependent on claim 3, wherein said control facility is arranged to operate to interchange at least one said fixed display with an adjacent display on the vdu screen.

14. A machine according to any one of claims 1 to 13, wherein said control facility is made available at the end of a game.

5 15. A machine substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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